CHAPTER 1

INTRODUCTION

1.1 Introduction

Wireless sensor networks have come to the forefront of the scientific community recently. Depending on its application needs, various technologies have been applied in design and development of wireless sensor network for remote monitoring. The technology is typically being used in various fields including meteorological system to solve unpredictable climate condition. In this case, several factors are involved including ambient temperature, relative humidity, and light brightness intensity. For this reason, a simple but an efficient professional meteorological system is required to monitor and control the environmental condition remotely. Lately, remote monitoring and controlling system has become a promising field of future technology which is entering a new era with the development of wireless sensing devices. In the beginning it is limited to supervisory control and data acquisition only, but these days remote monitoring and controlling refers to the measurement from a network operation centre and the ability to change any operation of certain devices from the room.

In similar manner, embedded system have gain enormous amount of processing power and functionality over recent years. Many of the formerly external components can now be integrated into a single system-on-chip. Embedded system is a combination of a microchip and software to perform a specific task, embedded into a manufactured product. This tendency has resulted in a dramatic reduction in the size and cost of embedded systems. Embedded system is an essential element of many innovations where it is designed to increase the reliability and performance of the product. The perfect combination of wireless and embedded system has been used by designer engineers to design various type of wireless monitoring and controlling system. This technology allows the remote location to report information of measurement to the system designer or operator. One of the advantages of this technology is it allows automatic monitoring, alerting and necessary record-keeping parameter for safe and efficient operations.

A distributed control strategy is the most desirable and reliable setup for monitoring environmental measurement. In addition, supervisory in real-time would preserve the quality for the process because of existence wireless link between the remote interface computer and the measurement sensor network. Furthermore, output control device provide eminence feature along the system. Thus, the aim of this project is to develop an embedded based monitoring and controlling system based on Zigbee technology. The system capable monitoring environment parameter at remote location and provide a communication link between the device and user for controlling purpose. The environment parameter specifically temperature, light intensity and humidity are displayed through computer using GUI application. The system provides mutual interoperability between various electronic and power devices as well as interactive interface for people to control the system operation.

1.2 Project Objectives

The main objective of this project is to develop a system that capable of monitoring and controlling various parameters in remote location and place the location into desire environment by using Zigbee-based wireless communication line. The environmental parameter specifically temperature, light intensity and humidity are displayed through personal computer at central operation network.